Volunteer Lake Assessment Program Individual Lake Reports

SWANZEY LAKE, SWANZEY, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,024	**Max. Depth (m):**	16.8	**Flushing Rate (yr^{-1}):**	0.8
Surface Area (Ac.):	117	**Mean Depth (m):**	5.5	**P Retention Coef:**	0.69
Shore Length (m):	3,400	**Volume (m^3):**	2,502,500	**Elevation (ft):**	524

TROPHIC CLASSIFICATION

Year	Trophic class
1986	MESOTROPHIC
2005	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

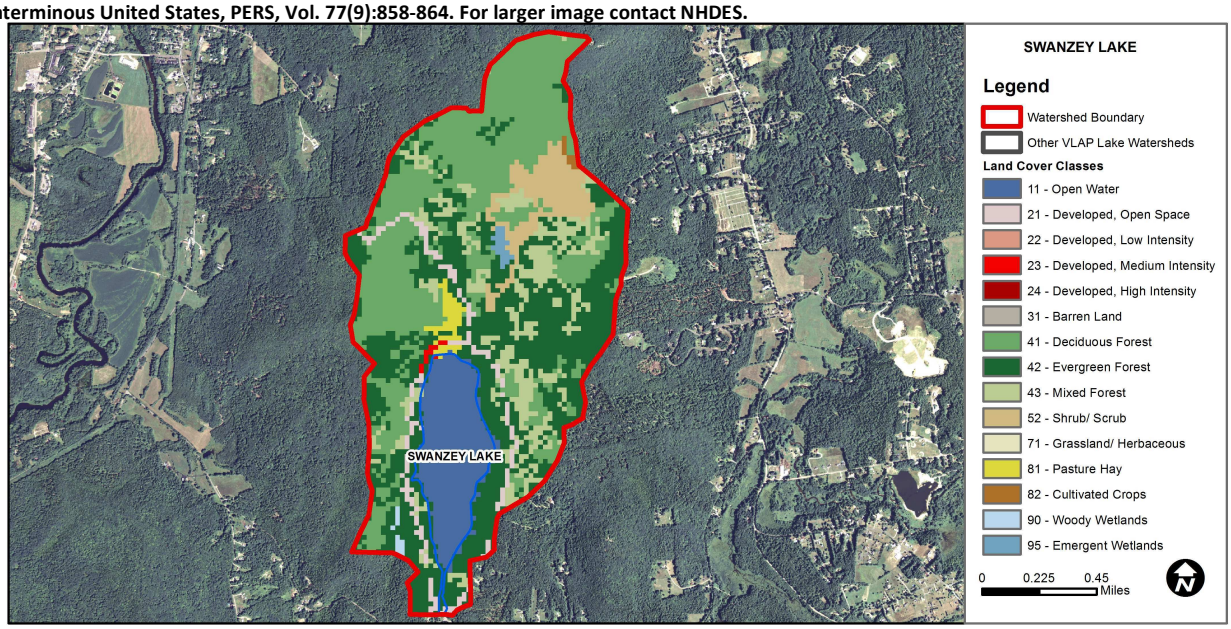
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

SWANZEY LAKE - CAMP SQUANTO BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
SWANZEY LAKE - RICHARDSON PARK TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

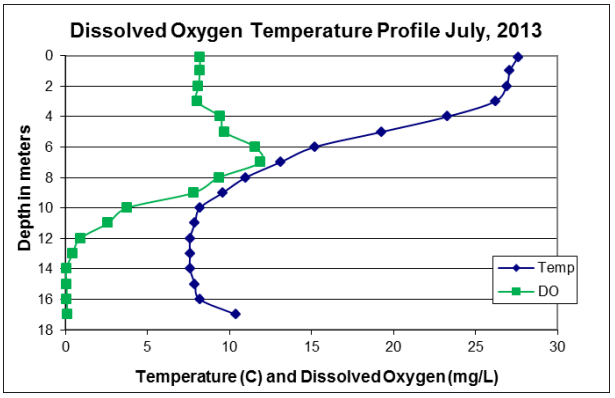


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	10.6	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	3.52	Deciduous Forest	33.2	Pasture Hay	1.18
Developed-Low Intensity	0	Evergreen Forest	34.38	Cultivated Crops	0.22
Developed-Medium Intensity	0.24	Mixed Forest	10.86	Woody Wetlands	0.28
Developed-High Intensity	0	Shrub-Scrub	5.22	Emergent Wetlands	0.48

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
SWANZEY LAKE, SWANZEY, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels increased gradually as the summer progressed however remained below the state median. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride were approximately equal to the state medians. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **E. COLI:** Tributary E. coli levels were much less than state standard for surface waters and Public Beach E. coli levels were much less than state standard for public beaches.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were low on each sampling event and were much less than the state median. Epilimnetic phosphorus levels have continually decreased since 2009. Historical trend analysis indicates stable epilimnetic phosphorus with low variability between years. Pine Inlet A and Outlet phosphorus levels were low and Pine Inlet B phosphorus was elevated in June after significant rains flushed wetland systems.
- **TRANSPARENCY:** Transparency was good and remained stable throughout the summer. Historical trend analysis indicates stable transparency with low variability between years.
- **TURBIDITY:** Deep spot, Pine Inlet A and Outlet turbidities were low on each sampling event. Pine Inlet B turbidity was slightly elevated in July and August.
- **PH:** Hypolimnetic and Pine Inlet B pH levels were lower than desirable range 6.5 – 8.0 units. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels decrease to below 1.0 mg/L in the Hypolimnion. As hypolimnetic oxygen levels deplete below 1.0 mg/L, phosphorus that is typically bound in bottom sediments may be released into the hypolimnion.
- **RECOMMENDED ACTIONS:** The increasing epilimnetic conductivity level may be a result winter snow and ice maintenance activities around the lake. Educate lake front property owners using salt alternatives and/or salt usage best management practices. Encourage local road agents to obtain a Voluntary NH Salt Applicator license through the UNH Technology Transfer Center's (T2) Green SnowPro Certification Program. Keep up the great work!



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

Table 1. 2013 Average Water Quality Data for SWANZEY LAKE

Station	Alk.	Chlor-a	Chloride	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	#/100ml	ug/l	m		ntu	
							NVS	VS		
Epilimnion	7.37	2.78	4	44.0		4	4.60	5.00	0.48	6.84
Metalimnion				44.3		6			0.55	6.85
Hypolimnion				46.9		11			0.86	6.06
Outlet				48.5	65	7			0.65	6.8
Pilgrim Pines Beach					11					
Pine Inlet A			3	47.3	10	8			0.54	6.52
Pine Inlet B			3	35.1	10	35			1.44	6.31
Public Beach					3					

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Degrading	Data significantly decreasing.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Degrading	Data significantly increasing.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.